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hold for all fields—an error common to nearly all books on this subject. And many other errors have been noted, most of them pertaining to the theory of instruments.

As in many other books, great use is made of the magnetic shell. In the reviewer's opinion magnets of all types, real or fictitious, but especially the magnetic shell, should be completely abolished from the fundamental parts of electrical theory—as indeed they have already been abolished by some writers. The reviewer must protest also against the author's use of the word *field*, which properly denotes a *region*, to designate field *strength* or field *intensity*; and the use of the word *force* in place of the word *stress* when two forces—both action and reaction—are contemplated. These usages are all too common, and the book under review is no more guilty than many others.

In spite of such defects as have been mentioned it may be stated again that this is a good book. And it should be useful to many students.

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The Science of Human Behavior: Biological and Psychological Foundations. By MAURICE PARMELEE, Ph.D. New York, The Macmillan Company. 1913. Pp. xviii + 443. \$2.00 net.

It is the subtitle rather than the main title that indicates the scope of this work, which might perhaps have been better named prolegomena to a science of human behavior. No attempt is made to gather together the rather extensive studies of human behavior already produced by experimental psychology, and indeed the existence of this work is not even recognized, nor are its methods set forth. The author's view is that human behavior must be approached from the biological and physiological side. "Psychical and social phenomena should be reduced as far as possible to biological terms, just as vital phenomena should be reduced as far as possible to chemical and physical terms" (Preface). "To begin the study of behavior from a biological point of view has, I believe, a very

wholesome effect, for it necessitates the use of more or less exact methods of observation which are not always used in psychology and sociology. The use of these methods results in the disappearance of hazy and mystical explanations of human phenomena frequently proposed by writers in these two sciences. These explanations are replaced by more or less exact mechanical explanations" (pp. 2-3). The nature of these mechanical explanations is indicated by the author's method, which seeks to obtain clear concepts of the simpler types of behavior, and then to show how these simpler acts are combined into more complex behavior of a mental and social sort. The method is, therefore, comparative and genetic; and phylogenetic rather than ontogenetic. Tropisms and other reactions of the simplest organisms, reflexes of animals possessing a nervous system, instincts, which are defined as combinations of reflexes integrated by the nervous centers, learning, intelligence, consciousness, society, are successively treated; and some attempt is made to trace the evolutionary process through these increasingly complex modes of behavior. As might be expected, this attempt to trace the phylogenesis of human behavior is not specially successful, on account of the impossibility of selecting a series of animal forms representing the direct line of human descent; and the study is thus, after all, comparative rather than genetic. For example, considerable attention is devoted to the social behavior of insects and of birds, which certainly has no direct bearing on the evolution of human behavior. For the specific purpose of the book, much of this incidental material might well be replaced by something on the growth of behavior in the human individual.

The book is of the Spencerian type, beginning with the characteristics of matter in general, and ending with social evolution. It has required the bringing together of material from various sciences: physics and chemistry, zoology, physiology, psychology, anthropology. One would expect it, accordingly, to be broad rather than notoriously exact; and it is likely to produce the same sort of impression

that is produced by Spencer's work, least satisfactory where the reader knows most about the subjects treated. Certainly under the heads of neurology and psychology, it is somewhat inaccurate and a trifle naïve. The author seems willing almost anywhere to take up a position on questions that are controverted and inherently difficult of decision. Another criticism is that the deductive tendency is more implicitly followed by the author than the nature of his material allows. Once having reached a (perhaps tentative) conclusion on some question, he is satisfied to use this conclusion as the basis of far-reaching deductions. For example, this is his evidence in favor of a richer emotional life in warm-blooded than in cold-blooded animals: "The warm-blooded type developed as a result of the development of the sympathetic nervous system, which regulates the vasomotor system in such a fashion as to keep the body at a uniform temperature by sending blood where more warmth is needed and stimulating the action of the sweat glands where the heat needs to be reduced. I have not the space to discuss the causes for this development here. As we have seen in an earlier chapter, the emotions arise out of the activity of the sympathetic system, so that the development of that system means the development of the emotional nature of these classes of animals. So that the emotions involved in sexual, parental and wider social relationships now begin to play a wider part" (pp. 372-373). It is but fair to say that the author's treatment is much more satisfactory when the broad trend of the book is considered than when particular passages are taken for examination. Certainly it is well to bring emphatically before the reading public the notion that a science of human behavior is possible (and actual, as well, to a much greater degree than this book indicates), and that this science is distinctly a biological science, related to the study of animal behavior, on one side, and on another, to the structure and functions of the nervous system.

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BOTANICAL NOTES

FIGHTING THE CHESTNUT BLIGHT

ONE of the most interesting contests is now being waged between the trained plant pathologists on the one hand and a parasitic fungus on the other, and thus far it must be admitted that the outcome of the battle is by no means as assured as we could wish it to be. The chestnut tree is found naturally in an area stretching from southern Maine to Georgia and Alabama and extending a greater or less distance east and west of the Appalachian Mountains. A few years ago (1904) a disease of the bark of this tree appeared near New York City, and from this point it has spread northeastward, westward and southeastward as far as Massachusetts, Vermont, Central Pennsylvania, Maryland and Virginia. It has been made out that the disease is due to a Sphaeriaceus fungus known as *Diaporthe parasitica*, the structure of which has been pretty well investigated.

So threatening has this disease become that last February a general conference was held in Harrisburg, Pennsylvania, for the consideration of ways and means for preventing its further spread, the results of which appeared a little later in a thick pamphlet of a little more than two hundred and fifty pages of papers, discussions and proposed programs. Many half-tone reproductions of drawings and photographs add greatly to the value of the publication, which must prove to be most useful to the man who wants to try to save his chestnut trees, as well as to the botanist who wishes to keep in touch with this contest between pathological science and a rapidly spreading, disease-producing fungus. As the pamphlet is a state publication it can no doubt be had by application to the governor, at Harrisburg, Pennsylvania.

BOTANICAL NOTES

A HANDY little flora of central and northern Europe has been compiled by F. Hermann, and published by Weigel (Leipzig) under the title of "Flora von Deutschland und Fennoskandinavien sowie von Island und Spitz-